JOURNAL OF

VESTIBULAR RESEARCH

Equilibrium & Orientation

An International Journal of Experimental and Clinical Vestibular Science

Contents/Author/Keyword Index

Volume 3, 1993

Pergamon Press

New York Oxford Seoul Tokyo

JOURNAL OF VESTIBULAR RESEARCH
Equilibrium and Orientation

Co-Editors-in-Chief

Ralph M. Jell
Basic Science

Desmond J. Ireland
Clinical Science

Garfield-Weston Vestibular Laboratory
The University of Manitoba Health Sciences Research Centre MS748
820 Sherbrooke Street
Winnipeg, MB, Canada R3A 1R9

Chairman

Geoffrey Melvill Jones
Department of Clinical Neurosciences
The University of Calgary Health Sciences Centre
3330 Hospital Drive N.W., Calgary, Alberta, Canada

Section Editors

Spatial Orientation
James R. Lackner
Ashton Graybiel Spatial Orientation Laboratory
Brandeis University
Waltham, MA 02254-9110

Alain Berthoz
Laboratoire de Physiologie Neurosensorielle
CNRS
15, Rue de L'Ecole de Medecine
75720 Paris Cedex 06, France

Neurochemistry and Neuropharmacology
Ottavio Pompeiano
Department of Physiology & Biochemistry
University of Pisa
Via S. Zeno 20-31
56127 Pisa, Italy

Kanemasa Mizukoshi
Dept. of Otolaryngology
Toyama Med. & Pharm. University
2630 Sugitani, Toyama
930-01, Japan

Theory and Modelling
Graham Barnes
MRC Human Movement and Balance Unit
The Institute of Neurology
Queen Square
London WC1N 3BG, UK

Paul DiZio
Ashton Graybiel Spatial Orientation Laboratory
Brandeis University
Waltham, MA 02254-9110

Anatomy and Cell Biology
Jean A. Buettner-Ennever
Institute of Neuropathology
University of Munich
Pettenkoferstr. 12
D-8000 Munich 2, Germany

Manning J. Correia
Departments of Otolaryngology & Physiology & Biophysics
The University of Texas Medical Branch at Galveston
7.318 John Sealy Hospital, Route E-03
Galveston, TX 77550-2778

Gaze Control
Volker Henn
Department of Neurology
University Hospital
CH-8091 Zurich, Switzerland

Gary D. Paige
Department of Neurology
University of Rochester Medical Center
601 Elmwood Avenue, Box 673
Rochester, NY 14642-8673

Oculomotor and Vestibulo-Ocular
G. Michael Halmagyi
Royal Prince Alfred Hospital
Dept. of Neurology
Camperdown NWS
2050 Sydney, Australia

Thomas Brandt
Ludwig Maximilians-Universität München
Klinikum Großhadern
NRO, Postfach 7012
8000 München 70, Germany

Posture and Balance Control
F. Owen Black
1040 N.W. 22nd Avenue, (N010)
Portland, OR 97210

John H.J. Allum
University ORL Clinic, Basel
Division of Exp. Audiology & Neurootology
Universitäts HNO-Klinik
CH-4031 Basel, Switzerland

Editorial Board

Robert W. Baloh
Los Angeles, CA
Hugh O. Barber
Toronto, Ontario, Canada
Kenneth Brookler
New York, NY
Bernard Cohen
New York, NY
Ian S. Curthoys
Sydney, Australia
Johannes Dichgans
Tübingen, Germany
Malcolm D. Graham
Savannah, GA
Fred E. Guedry, Jr.
Pensacola, FL
Timothy Hain
Baltimore, MD
Susan J. Herdman
Baltimore, MD
Makoto Igarashi
Tokyo, Japan
I.B. Koslovskaya
Moscow, Russia
Hana Krejcova
Prague, Czechoslovakia
Toru Matsunaga
Osaka, Japan
Lewis M. Nasher
Portland, OR
Michael Norré
Leuven, Belgium
Lars M. Ödkvist
Linköping, Sweden
Charles M. Oman
Cambridge, MA
Michael M. Paparella
Minneapolis, MN
Barry W. Peterson
Chicago, IL
Ilmari Pyykkö
Helsinki, Finland
Ted Raphan
Brooklyn, NY
Millard F. Reschke
Houston, TX
Robert H. Schor
Pittsburgh, PA
Charles W. Stockwell
Southfield, MI
Walter Waespe
Zurich, Switzerland
David S. Zee
Baltimore, MD

Production Editor: James P. Flannery, Pergamon Press, Tarrytown, New York.

Editorial Office: Garfield-Weston Vestibular Laboratory, Health Sciences Clinical Research Centre MS748, University of Manitoba, 820 Sherbrooke Street, Winnipeg, MB, Canada R3A 1R9.

Publishing, Subscription, and Advertising Offices: Pergamon Press Inc., 660 White Plains Road, Tarrytown, New York 10591-5153, USA, INTERNET "PPI@PERGAMON.COM" and Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 0BW, England.

Published Quarterly. *Annual Institutional Subscription Rate* (1993): £100.00 (US $160.00). Sterling prices are definitive. US dollar prices are quoted for convenience only, and are subject to exchange rate fluctuation. Prices include postage and insurance and are subject to change without notice.

Journal of Vestibular Research, Vol. 3, pp. VII–XVI, 1993
Printed in the USA. All rights reserved.

0957-4271/93 $6.00 + .00
Copyright © 1993 Pergamon Press Ltd.

CONTENTS INDEX

VOLUME 3, 1993

Volume 3, Number 1 Spring 1993

CONTENTS

Special Issue
Vestibular Control of Posture and Gait

R.M. Jell **D.J. Ireland**	v	Editorial
F.B. Horak **M. Woollacott**	1	Guest Editorial
T. Brandt **M. Dieterich**	3	Vestibular Falls
J.R. Lackner **P. DiZio**	15	Spatial Stability, Voluntary Action and Causal Attribution During Self-Locomotion
B.E. Maki **R.S. Whitelaw**	25	Influence of Expectation and Arousal on Center-of-Pressure Responses to Transient Postural Perturbations
T. Mergner **F. Hlavacka** **G. Schweigart**	41	Interaction of Vestibular and Proprioceptive Inputs
J.H.J. Allum **F. Honegger** **H. Schicks**	59	Vestibular and Proprioceptive Modulation of Postural Synergies in Normal Subjects
W. Bles **B. de Graaf**	87	Postural Consequences of Long Duration Centrifugation
	97	Vestibular Bibliography
	99	Announcement

INDEXED IN Cam. Sci. Abstr., CABS, ISI, PsychINFO

ISSN 0957-4271
(936)

Volume 3, Number 2 Summer 1993

CONTENTS

J.L. Demer **J.G. Oas** **R.W. Baloh**	101	Visual-Vestibular Interaction in Humans During Active and Passive, Vertical Head Movement
R.J. Leigh **S.H. Seidman** **M.P. Grant** **J.P. Hanna**	115	Loss of Ipsidirectional Quick Phases of Torsional Nystagmus with a Unilateral Midbrain Lesion
D.M. Merfeld **L.R. Young** **G.D. Paige** **D.L. Tomko**	123	Three Dimensional Eye Movements of Squirrel Monkeys Following Postrotatory Tilt
D.M. Merfeld **L.R. Young** **C.M. Oman** **M.J. Shelhamer**	141	A Multidimensional Model of the Effect of Gravity on the Spatial Orientation of the Monkey
E. Tolu **M. Pugliatti**	163	The Vestibular System Modulates Masseter Muscle Activity
S. Padoan **P.A. Fransson** **M. Magnusson** **R. Johansson**	173	Postural Control Reduced by Subanesthetic Nitrous Oxide Narcosis
C. Tiliket **M. Shelhamer** **H.S. Tan** **D.S. Zee**	181	Adaptation of the Vestibulo-Ocular Reflex with the Head in Different Orientations and Positions Relative to the Axis of Body Rotation
		Notice
	197	Video Tapes Available
	199	Vestibular Bibliography

CONTENTS

Special Issue
Space and the Vestibular System

L.R. Young	203	Guest Editorial
A.H. Clarke **W. Teiwes** **H. Scherer**	207	Evaluation of the Torsional VOR in Weightlessness
L.N. Kornilova **V. Grigorova** **G. Bodo**	219	Vestibular Function and Sensory Interaction in Space Flight
L.R. Young **C.M. Oman** **D. Merfeld** **D. Watt** **S. Roy** **C. DeLuca** **D. Balkwill** **J. Christie** **N. Groleau** **D.K. Jackson** **G. Law** **S. Modestino** **W. Mayer**	231	Spatial Orientation and Posture During and Following Weightlessness: Human Experiments on Spacelab Life Sciences 1
M.D. Ross	241	Morphological Changes in Rat Vestibular System Following Weightlessness
M. Suzuki **Y. Harada** **T. Sekitani**	253	Vestibular Endorgan of the Frog After the Space Flight and Postural Alteration of the Neurectomized Frog—Its Morphological and Functional Resilience
J.P. Roll **K. Popov** **V. Gurfinkel** **M. Lipshits** **C. André-Deshays** **J.C. Gilhodes** **C. Quoniam**	259	Sensorimotor and Perceptual Function of Muscle Proprioception in Microgravity

continued

J. Massion **V. Gurfinkel** **M. Lipshits** **A. Obadia** **K. Popov**	275	Axial Synergies Under Microgravity Conditions
C.H. Markham **S.G. Diamond**	289	A Predictive Test for Space Motion Sickness
D.L. Harm **D.E. Parker**	297	Perceived Self-Orientation and Self-Motion in Microgravity, After Landing and During Preflight Adaptation Training
H. Mittelstaedt **S. Glasauer**	307	Crucial Effects of Weightlessness on Human Orientation
C.M. Oman **M.D. Balkwill**	315	Horizontal Angular VOR, Nystagmus Dumping, and Sensation Duration in Spacelab SLS-1 Crewmembers
C. André-Deshays **I. Israël** **O. Charade** **A. Berthoz** **K. Popov** **M. Lipshits**	331	Gaze Control in Microgravity: 1. Saccades, Pursuit, Eye–Head Coordination
I. Israël **C. André-Deshays** **O. Charade** **A. Berthoz** **K. Popov** **M. Lipshits**	345	Gaze Control in Microgravity: 2. Sequences of Saccades Toward Memorized Visual Targets
J.R. Lackner **P. DiZio**	361	Multisensory, Cognitive, and Motor Influences on Human Spatial Orientation in Weightlessness
	I	Vestibular Bibliography

CONTENTS

T. Brandt **S. Steddin**	373	Current View of the Mechanism of Benign Paroxysmal Positioning Vertigo: Cupulolithiasis or Canalolithiasis?
M. Ålund **T. Ledin** **L. Ödkvist** **S.-E. Larsson**	383	Dynamic Posturography Among Patients With Common Neck Disorders: A Study of 15 Cases With Suspected Cervical Vertigo
O. Pompeiano **P. Luccarini** **Y. Gahery** **G. Blanchet**	391	Somatotopical Effects of Local Microinjection of GABAergic Agents in Deiters Nucleus on the Posturokinetic Responses to Cortical Stimulation
R.P. Di Fabio **J.H. Anderson**	409	Effect of Sway-Referenced Visual and Somatosensory Inputs on Human Head Movement and Postural Patterns During Stance
E.A. Keshner **J.H.J. Allum** **F. Honegger**	419	Predictors of Less Stable Postural Responses to Support Surface Rotations in Healthy Human Elderly
	I	Vestibular Bibliography
	V	Contents/Author/Keyword Index Volume 3, 1993

AUTHOR INDEX

VOLUME 3, 1993

Allum, JHJ, 59, 419
Ålund, M, 383
Anderson, JH, 409
André-Deshays, C, 259, 331, 345

Balkwill, D, 231
Balkwill, MD, 315
Baloh, RW, 101
Berthoz, A, 331, 345
Blanchet, G, 391
Bles, W, 87
Bodo, G, 219
Brandt, T, 3, 373

Charade, O, 331, 345
Christie, J, 231
Clarke, AH, 207

de Graaf, B, 87
DeLuca, C, 231
Demer, JL, 101
Di Fabio, RP, 409
Diamond, SG, 289
Dieterich, M, 3
DiZio, P, 15, 361

Fransson, PA, 173

Gahery, Y, 391
Gilhodes, JC, 259
Glasauer, S, 307
Grant, MP, 115
Grigorova, V, 219
Groleau, N, 231
Gurfinkel, V, 259, 275

Hanna, JP, 115
Harada, Y, 253
Harm, DL, 297
Hlavacka, F, 41
Honegger, F, 59, 419
Horak, FB, 1

Ireland, DJ, v
Israël, I, 331, 345

Jackson, DK, 231
Jell, RM, v
Joansson, R, 173

Keshner, EA, 419
Kornilova, LN, 219

Lackner, JR, 15, 361
Larsson, S-E, 383
Law, G, 231
Ledin, T, 383
Leigh, RJ, 115
Lipshits, M, 259, 275, 331, 345
Luccarini, P, 391

Magnusson, M, 173
Maki, BE, 25
Markham, CH, 289
Massion, J, 275
Mayer, W, 231
Merfeld, D, 231
Merfeld, DM, 123, 141
Mergner, T, 41
Mittelstaedt, H, 307
Modestino, S, 231

Oas, JG, 101
Obadia, A, 275
Ödkvist, L, 383
Oman, CM, 141, 231, 315

Padoan, S, 173
Paige, GD, 123
Parker, DE, 297
Popeiano, O, 391
Popov, K, 259, 275, 331, 345
Pugliatti, M, 163

Quoniam, C, 259

Roll, JP, 259
Ross, MD, 241
Roy, S, 231

Scherer, H, 207
Schicks, H, 59
Schweigart, G, 41
Seidman, SH, 115
Sekitani, T, 253
Shelhamer, M, 181
Shelhamer, MJ, 141
Steddin, S, 373
Suzuki, M, 253

Tan, HS, 181
Teiwes, W, 207
Tiliket, C, 181
Tolu, E, 163
Tomko, DL, 123

Watt, D, 231
Whitelaw, RS, 25
Woollacott, M, 1

Young, LR, 123, 141, 203, 231

Zee, DS, 181

KEYWORD INDEX

VOLUME 3, 1993

active head movement, 101
adaptation, 15, 173, 181, 231, 259, 275
aging, 419
arousal, 25

balance, 3, 25, 409
  control, 419
benign paroxysmal positioning vertigo (BPPV), 373
buoyancy mechanism, 373

canalolithiasis, 373
compensation, 253
conceptual model, 41
context specificity, 181
coordination, 275
cortical stimulation, 391
cosmonauts, 219
cupulolithiasis, 373

Deiters nucleus, 391
dynamic posturography, 383

EMG, 59, 419
equilibrium, 275, 383, 409
expectation, 25
eye
  movements, 123, 219
  torsion disconjugacy, 289
eye/head, 3311

falls, 3
force-independent components, 307

GABAergic agents, 391
gaze, 331, 345

head control, 409
human, 3, 41, 231, 331, 345
hyper G-load, 87

interaction of otoliths and neck receptors, 307

kinaesthesia, 259

local microinjection, 391
locomotion, 15

man, 259
masseter muscles, 163
mechanoreceptors, 383
memory, 345
microgravity, 259, 275, 331, 345
midbrain, 115
model, 141
monkey, 123, 141
morphology, 241
motion sickness, 87
movement, 275
muscle spindle, 361
myofascial pain syndromes, 383

N_20, 173
nystagmus, 115

ocular
  counterrolling, 289
  torsion, 207
orientation, 361
otolith
  asymmetry, 289
  organs, 123

passive head movement, 101
perception, 15, 231, 297
positional vertigo, 373
postural
  control, 25, 59
  stability, 87
posture, 3, 173, 231, 259, 409
  control, 419
posturokinetic responses, 391
preflight adaptation training, 297
proprioception, 361
proprioceptive, 259
  reflexes, 59
pursuit, 331

rat, 241

saccade, 331, 345
saccular bias, 307
self-motion perception, 41
semicircular canals, 123
sensory epithelia, 253

simulation, 297
somatotopical organization, 391
space, 297
  adaptation syndrome, 87
  motion sickness, 289, 361
  physiology, 315
  shuttle, 315
spatial orientation, 41, 141, 315
subjective vertical, 87
  in weightlessness, 307
synapse, 241

tilting posture, 253
torsional eye movements, 115
transfer, 181

uticle, 241

vertical, visual-vestibular interaction, 101
vertigo, 383
vestibular, 231, 315
  disorders, 3
  function, 219
    tests, 383
  neurectomy, 253
  system, 163
vestibular-proprioceptive interaction, 41
vestibulo-ocular reflex, 3, 115, 123, 141, 207, 315
vestibulo-oculomotor interaction, 219
vestibulo-spinal reflexes, 59
vestibulomasseteric reflex, 163
vestibulospinal influences, 391
vibration, 173, 259
video-oculography, 207
virtual reality, 297
vision, 15, 173
VOR, 181

weightlessness, 207, 219, 231, 241, 259, 275